CLAIMS

1. A martensitic stainless steel comprising C: 0.01 – 0.10%, Si: 0.05 –1.0%, Mn: 0.05 – 1.5%, P: not more than 0.03%, S: not more than 0.01%, Cr: 9 – 15%, Ni: 0.1 – 4.5%, Al: not more than 0.05% and N: not more than 0.1% in mass %, and further comprising at least one of Cu: 0.05 – 5% and Mo: 0.05 – 5%, the residual being Fe and impurities, wherein the contents of Cu and Mo satisfy the following formula (a),

$$0.2\% \leq Mo + Cu/4 \leq 5\% \quad \ldots (a)$$

and wherein the hardness is 30 – 45 in HRC and the amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %.

2. A martensitic stainless steel comprising C: 0.01 – 0.10%, Si: 0.05 –1.0%, Mn: 0.05 – 1.5%, P: not more than 0.03%, S: not more than 0.01%, Cr: 9 – 15%, Ni: 0.1 – 4.5%, Al: not more than 0.05% and N: not more than 0.1% in mass %, and further comprising at least one of Cu: 0.05 – 5% and Mo: 0.05 – 5%, the residual being Fe and impurities, wherein the contents of Cu and Mo satisfy the following formula (b),

$$0.55\% \leq Mo + Cu/4 \leq 5\% \quad \ldots (b)$$

and wherein the hardness is 30 – 45 in HRC and the amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %.

3. A martensitic stainless steel comprising C: 0.01 – 0.10%, Si: 0.05 –1.0%, Mn: 0.05 – 1.5%, P: not more than 0.03%, S: not more than 0.01%, Cr: 9 – 15%, Ni: 0.1 – 4.5%, Al: not more than 0.05% and N: not more than 0.1% in mass %, and further comprising at least one of Cu: 0.05 – 5% and Mo: 0.05 – 5%, and further comprising one or more elements of Ti: 0.005 – 0.5%, V: 0.005 – 0.5% and Nb: 0.005 – 0.5%, the residual being Fe and impurities, wherein the contents of Cu and Mo satisfy the following formula (a),

$$0.2\% \leq Mo + Cu/4 \leq 5\% \quad \ldots (a)$$

and wherein the hardness is 30 – 45 in HRC and the amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %.

4. A martensitic stainless steel comprising C: 0.01 – 0.10%, Si: 0.05 –1.0%, Mn:

0.05 – 1.5%, P: not more than 0.03%, S: not more than 0.01%, Cr: 9 – 15%, Ni: 0.1 – 4.5%, Al: not more than 0.05% and N: not more than 0.1% in mass %, and further comprising at least one of Cu: 0.05 – 5% and Mo: 0.05 – 5%, and further comprising one or more elements of Ti: 0.005 – 0.5%, V: 0.005 – 0.5% and Nb: 0.005 – 0.5%, the residual being Fe and impurities, wherein the contents of Cu and Mo satisfy the following formula (b),

$$0.55\% \leq Mo + Cu/4 \leq 5\% \qquad (b)$$

and wherein the hardness is 30 – 45 in HRC and the amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %.

5. A martensitic stainless steel according to Claim 1, wherein said steel further comprises one or more elements of B: 0.0002 – 0.005%, Ca: 0.0003 – 0.005%, Mg: 0.0003 – 0.005% and rare earth elements: 0.0003 – 0.005% in mass %.

6. A martensitic stainless steel according to Claim 2, wherein said steel further comprises one or more of B: 0.0002 – 0.005%, Ca: 0.0003 – 0.005%, Mg: 0.0003 – 0.005% and rare earth elements: 0.0003 – 0.005% in mass %.

7. A martensitic stainless steel according to Claim 3, wherein said steel further comprises one or more elements of B: 0.0002 – 0.005%, Ca: 0.0003 – 0.005%, Mg: 0.0003 – 0.005% and rare earth elements: 0.0003 – 0.005% in mass %.

8. A martensitic stainless steel according to Claim 4, wherein said steel further comprises one or more elements of B: 0.0002 – 0.005%, Ca: 0.0003 – 0.005%, Mg: 0.0003 – 0.005% and rare earth elements: 0.0003 – 0.005% in mass %.